Persuasive Interaction for Collectivist Cultures

Rilla Khaled[1] **Robert Biddle**[2] **James Noble**[1] **Pippin Barr**[1]
Ronald Fischer[1]

[1] Victoria University of Wellington, New Zealand
[2] Carleton University, Canada
Email: `rkhaled@mcs.vuw.ac.nz`

Abstract

Persuasive technology is defined as "any interactive product designed to change attitudes or behaviours by making desired outcomes easier to achieve". It can take the form of interactive web applications, hand held devices, and games. To date there has been limited research into persuasive technology outside of America. Cross-cultural research shows that in order for persuasion to be most effective, it is often necessary to draw upon important cultural themes of the target audience. Applying this insight to persuasive technology, we claim that the set of persuasive technology strategies as described by B J Fogg caters to a largely *individualist* audience. Drawing upon cross-cultural psychology and sociology findings about patterns of behaviour commonly seen in collectivists, we present a principled set of *collectivism*-focused persuasive technology strategies. These strategies are: *group opinion, group surveillance, deviation monitoring, disapproval conditioning*, and *group customisation.* We also demonstrate how application of the strategies can support the design of a collectivist, persuasive game.

Keywords: persuasive technology, culture, games.

1 Introduction

A persuasive technology is "any interactive product designed to change attitudes or behaviours by making desired outcomes easier to achieve" (Fogg 2003). While the concept of *persuasion* can sometimes encompass a range of meanings, Fogg defines it as "an attempt to shape, reinforce, or change behaviors, feelings, or thoughts about an issue, object, or action" (Fogg 1998).

A variety of interfaces have been used for persuasive technologies, including interactive web-based applications (Sillence, Briggs, Fishwick & Harris 2004, O'Grady 2003, Shelat & Egger 2002), computer and video games (Ministry of Health 2004), robots (Dautenhahn 1999), computerised toys (Fogg 2003), and so on. The potential application areas for persuasive technologies are numerous, the most common of which to date include marketing, health, safety, and environmental conservation (King & Tester 1999). Other application areas include politics, religion, gaming, self-efficacy, occupational effectiveness, and empathy, amongst a long list of others (Fogg 2003).

The *persuasive* element of persuasive technology has often led some to question whether it can be used non-deceptively upon its users. Berdichevsky and Neuenschwander (Berdichevsky & Neuenschwaner 1999) proposed an ethics framework for analysing acts of persuasion, which takes into consideration the privacy of users, the clarity of the representation of persuasion, and the accuracy of information portrayal. The "golden rule" guiding the overall framework is that *the creators of a persuasive technology should never seek to persuade anyone of something they themselves would not consent to be persuaded of.* So as with any type of persuasion, while the persuasive intent of a persuasive technology will *never* be value free, it is the responsibility of the designer to design ethical and non-deceptive technologies.

Much of the existing research carried out on persuasive technology originates from America, but as yet there has been little research focused on persuasive technology outside of America. Various academics will agree that America has a reasonably unique culture (Hofstede 1996, Triandis 1995). In discussing culture, we rely on two important dimensions: *individualism* and *collectivism.* At present, much of cross-cultural research, particularly from the fields of psychology and business, focuses on these dimensions. This indicates that they are believed to be the most important dimensions, thus making them reasonable ones to adopt. Certain researchers have also shown that the dimensions of individualism and collectivism account for most of the variance in global differences (Hofstede 1996, Triandis 1995). We define individualism and collectivism as follows:

Individualist societies are ones in which the ties between individuals are loose: people are expected to look after themselves and their immediate family only. Individual interests outweigh group interests, and individualists tend to be self-motivated and goal-oriented, using guilt and loss of self-respect as motivators (Hofstede 1996). Individualists also exhibit more attitude-behaviour consistency than collectivists, perform their duties if it is advantageous in terms of benefit, and have a self-identity that is defined independently of specific collectives (Triandis 1995).

In contrast, *collectivist* societies are ones in which, from birth onwards, people are integrated into strong, cohesive *in-groups*, which are groups of people about whose welfare a person is concerned, and separation from whom leads to anxiety. These in-groups protect their members in exchange for unquestioning loyalty. Group interests outweigh individual interests, and individuals strive to maintain social harmony, adapt skills and virtues necessary for being a good group member and maintaining tradition. Shame and loss of face are typical motivators (Hofstede 1996). Collectivists exhibit less attitude-behaviour consistency than individualists, enjoy doing "what is right" for their collective, and have self identities that are strongly linked to attributes of their group (Triandis 1995).

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Although the behavioural characteristics mentioned in our descriptions of individualism and collectivism are widely accepted, the way in which the notions of individualism and collectivism are understood can vary. Some see individualism and collectivism as two ends of the same continuum, while others believe that they are two separate constructs. It is important to remember that both of these classifications are used in the greater context of people's *societies*, that is, when we refer to an individualist, we refer to someone who has spent their early years in an individualist society. Certainly particular situations may cause someone from an individualist society to act in an atypical collectivist manner, but we will limit ourselves in this paper to focusing on typical behaviours.

We claim that the current persuasive strategies embodied in persuasive technology interfaces are tailored to an individualist audience and might therefore be less effective on people in the many collectivist cultures around the world. Based on cross-cultural psychology and sociology findings about behavioural tendencies of collectivists, we present a principled set of strategies targeted for use in tools designed for a collectivist audience: *group opinion, group surveillance, deviation monitoring, disapproval conditioning*, and *group customisation.* To illustrate how these strategies may be used in applications, we describe the design of a smoking cessation game that utilises the strategies in its interface.

The rest of this paper is structured as follows. In section 2 we discuss how persuasive technology designs are influenced by culture: both from the perspectives of target users *and* designers. Section 3 presents our principled set of collectivism-focused persuasive technology strategies. Section 4 shows how the strategies can be applied in the design of a persuasive game, and finally in section 5 we present our conclusions.

2 Background

2.1 Appealing to audiences

Culture plays a very influential role in shaping people's attitudes and behaviours, affecting attitudes and behaviours of individuals before and after persuasion, depending on how central the topic of persuasion is to the culture (Aaker 2000). Research findings demonstrate that the cultural background of the message recipients has a significant impact upon how they perceive and receive various persuasive messages (Han & Shavitt 1994, Aaker 2000, Gurhan-Canli & Maheswaran 2000). Certain persuasion tactics and strategies have been found to work effectively on an audience of one culture, while being ineffective on an audience of a different culture (Lin 1993, Tansey, Hyman & Zinkhan 1990, Biswas, Olsen & Carlet 1992).

Although it is true that the American market is diverse and hard to characterise, America has certain cultural characteristics that make it somewhat unique. For example, it has scored as the most individualist country in the world in various studies measuring worldwide individualistic and collectivist tendencies (Hofstede 1996, Triandis, Bontempo, Villareal, Asai & Lucca 1988, Kluckhohn & Strodtbeck 1961). Furthermore, the specific *type* of individualism that exists in America sets it apart from other western countries: competition and power hierarchies are more evident there (Triandis 1995), and values such as *ambition, daring, influential, successful, pleasure, exciting life* and *varied life* are prioritised (Schwartz 2003). In contrast, most other individualist societies tend to be less competitive and hierarchical, and values such as *unity with nature, world at peace, protect environment, broadmindedness, curiosity, freedom* and *creativity* are given greater precedence (Schwartz 2003).

While in recent years, the amount of research interest in persuasive technology has increased, little of this research has taken place outside of America. To some extent, it is undeniable that for many interactive products, the largest number of sales occur within America. Therefore conceivably, from a commercial revenue perspective it is currently justifiable to focus mainly on the American market. Nonetheless it is unlikely that this will always be the case, and for this reason it seems short-sighted to focus design strategies on the prevalent attitudes, needs, and beliefs of one particular audience.

Furthermore, from the context of persuasive technology usage, while the persuasive technologies developed for the American market may well integrate seamlessly into the average American user's everyday settings, it is quite feasible that technology integration and usage will *not* be so smooth for non-American users.

2.2 Unconscious "embedding" of culture

Another issue to consider is the cultural standpoint of the designers of persuasive technology: at present, many of these technologies are being designed in America. In interviews we have conducted with persuasive website designers, it appears that presently most of them do not *consciously* set out to target one cultural audience over another. Nonetheless, while designers might not explicitly set out to develop strategies to cater to a particular population, culture is such a pervasive factor that it would have certainly impacted on the strategies that emerged. To quote Edward Hall:

> What makes it doubly hard to differentiate the innate from the acquired is the fact that, as people grow up, everyone around them shares the same patterns (Hall 1976).
>
> The cultural unconscious, like Freud's unconscious, not only controls mans actions but can be understood only by painstaking processes of detailed analysis (Hall 1976).

In other words, while it may be exceptionally difficult for American designers to identify American ideals that they have unknowingly "embedded" into their technologies, these ideals and values will resurface when the technologies are used on audiences the designers were not intending to design for:

> The only time one is aware of the control system is when things don't follow the hidden program. This is most frequent in intercultural programs (Hall 1976).

Our earlier research supports this theory (Khaled, Noble & Biddle 2005). Fogg has identified seven typically used persuasive technology tool strategies (Fogg 2003). *Reduction* technologies are used to make a complex task simpler, usually by eliminating some of the steps necessary in the step sequence to achieve a certain goal. *Tunnelling* technologies are designed to reduce "uncertainty", by leading users through a predetermined sequence of actions or events, step by step, to encourage certain behaviours (and/or change old ones). *Customisation* and tailoring technologies are computing products that provide users with information relevant to them, for the purpose of getting them to change certain attitudes or behaviours.

Suggestion technologies are technologies that remind people to perform certain behaviours at opportune moments. *Self monitoring* technologies allow people to monitor themselves to inform them about how they might modify their attitudes or behaviours to achieve a related pre-determined goal or outcome. *Surveillance* technologies allow one party to monitor the behaviour of another party through observation, as when people know they are being watched they tend to behave differently. *Conditioning* technologies work by making use of operant conditioning in the form of positive reinforcement to reinforce target behaviours when they occur.

A preliminary analysis of these strategies shows that five of them favour individualist motivations over collectivist ones, while only one favours collectivist motivations (Khaled et al. 2005). Currently *no* explicit processes or frameworks exist for guiding the development of persuasive technologies destined for audiences of a particular culture. Additionally, It seems that no one has yet approached the task of persuasive technology design from the perspective of cultural ideology integration.

3 Collectivism-focused persuasive strategies

There is a substantial body of literature examining and describing patterns, value systems, and common beliefs in individualist and collectivist societies. This literature spans several fields, including cross-cultural psychology, sociology, and anthropology. For our purposes, we have used this literature in two ways: the first was to investigate standard patterns of individualist behaviour in order to see whether these patterns were referenced or leveraged in Fogg's persuasive technology strategies. The second was to focus on the findings concerning collectivist behaviours and cultural norms, and to leverage these norms in a new principled set of persuasive technology strategies designed for use by a collectivist audience. So far, we have identified five of these collectivism-focused strategies: *group opinion, group surveillance, disapproval conditioning, deviation monitoring*, and *group customisation*. These strategies are described in detail below.

Group opinion During the decision making process, collectivists generally place more importance on the opinions of others in their in-group than do individualists, and consequently the opinions of others typically have a strong shaping influence on their eventual decisions (Aaker & Maheswaran 1997, Pavlou & Chai 2002). Additionally, research has shown that collectivists tend to be less effective if they feel they are performing an activity in isolation (Hofstede 1996, Triandis 1995). A *group opinion* strategy might therefore ask a user to make a decision, providing the user with opinions of other in-group members, or similar[1] others. This would effectively lessen the user's feelings of isolation, as well as reduce time that might be taken for the individual to consult members of her in-group regarding their opinions. The representation of opinions might take a variety of forms, such as a pie chart or line graph notation, numerical form, or a textual listing. A strategy of this sort would need to rely on the technology having access to a range of character profiles and answers. Recommender systems have some similarities to this concept: they generally aggregate previously supplied user recommendations to make a new suggestion, or find a recommendation from a user whose profile matched the user seeking a recommendation (Sinha & Swearingen 2001). Research on recommender systems conducted on American participants has shown that people still prefer recommendations made by their friends over system-generated recommendations (Sinha & Swearingen 2001). Another American study shows that with the exception of Amazon, which rates at 20%, only about 4% of the recommendations made by recommender systems are likely to be acted upon by users (Swearingen & Sinha 2002). It is interesting to speculate about whether participants from collectivist societies feel differently about recommender systems. Nonetheless, it seems that the main difference between the group opinion strategy and the recommender system concept is that a group opinion tool would need to have a very carefully designed facility for matching users, that would take into account similarity, shared acquaintance connections, hierarchy, and trust. With modifications, the recommender system infrastructure could be adapted to do this.

Group surveillance While individualists tend to use guilt as a negative motivational force, collectivists tend to use shame, i.e. shame upon the in-group as a consequence of their actions (Hofstede 1996, Triandis 1995). As it is currently used, the *surveillance* strategy tracks the behaviours of an individual or a group of individuals, but generally results in either the promise of rewards *for the individual* or punishment *for the individual* (Fogg 2003). Collectivists' self identities are strongly tied to attributes of their in-group, and furthermore they seem to be more effective in group situations (Triandis 1995, Hofstede 1996). In this way, they are concerned with being able to act as contributing team members. A *group surveillance* strategy could take advantage of these ideas by tracking behaviours of individuals, in order to either reward an entire group for the actions of the individual or impose group penalties for the actions of the individual. This would cause normative influence to begin acting as a motivator, which is commonplace for collectivists (Triandis 1995). While it seems that this strategy is very unforgiving for failure of any sort, in a way it also has a failure neutralising effect: one person's failure effectively becomes everyone's concern, so there is a safety-net effect at work. Such a strategy would rely on clear definitions of groups and group members, so that individuals would know whose actions affect them, and vice versa.

Disapproval conditioning Individualists tend to make use of positive reinforcement as a motivational strategy (Triandis 1995). Fogg's *conditioning* strategy promotes the use of positive reinforcement as well, arguing that the use of negative reinforcement would be unethical (Fogg 2003). While this may be true, collectivists are more accustomed to negative reinforcement as a means of motivation (Triandis 1995). A *disapproval conditioning* strategy would therefore be similar to the conditioning strategy, except that it would use negative reinforcement as a motivator for users to change their attitudes and/or behaviours. While this certainly raises ethical issues from a western perspective, i.e. whether the use of negative reinforcement is justifiable as a means to a goal one wishes to achieve, users could be given the option of establishing what form (and level!) of negative reinforcement they wish to receive, along with the ability to disable or modify the negative reinforcement at any point. To illustrate this concept using a hypothetical product, consider a set of persuasive bathroom scales, into which users can enter their height and ideal weight range, along with reminders or messages they want to be shown when they weigh themselves. With this product, users would still have control over the feedback given to them, thus somewhat side stepping the ethical issues that may be associated to people unknowingly subjecting themselves to technology "criticisms".

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[1] Similar perhaps in terms of socio-economic background, career, interests, etc.

Deviation monitoring Collectivists aim to fit in with their in-groups, in terms of behaviours and actions. In this way, they are *self monitoring* their behaviours to adapt to the group and situation (Fazio & Roskos-Ewoldsen 1994). Often they seek to find out how they may be deviating from their group norms, as they do not want to "stand out". Collectivist cultures also tend to be "tight", where *tightness* refers to the extent members of a culture agree about what constitutes correct action, whether they are expected to behave exactly according to the norms of the culture, and whether they suffer or offer severe criticism for even slight deviations from the norm (Triandis 1995). In tight cultures there are generally clear ideas about what constitutes correct and incorrect action, whereas in looser, generally more individualist cultures, there may instead be a range of acceptable actions (Triandis 1995). Given that in collectivist cultures, rules for behaviour are fairly fixed, it should be possible to code knowledge about correct and incorrect behaviours into technology. A *deviation monitoring* strategy might therefore monitor a user's actions and notify them if their behaviour "deviated" from preset "correct" behaviours. The user should, however, be given the option of identifying correct and incorrect behaviours, which will effectively specify which incorrect behaviours they want to be alerted to. As with disapproval conditioning, this would allow users to ultimately have control over how the technology interacts with them.

Group customisation It has often been noted that collectivists generally have less well-defined "personalities" than individualists, and that the way they behave from one situation to the next is heavily dependent on the context, actions, and attitudes of their in-group. When Fogg describes the *customisation* strategy, he refers to individual preferences and goals (Fogg 2003). While it will be true at some level that culture aside, *everyone* has various personal needs, in collectivist cultures it is noble to put in-group goals ahead of one's own goals (Triandis 1995, Hofstede 1996). As a consequence, in-group preferences might also out-weigh individual preferences in many circumstances, particularly in applications that are accessible by various members of the same in-group. A *group customisation* strategy might allow one member of an in-group, or perhaps various members, to customise application settings on behalf of the in-group's needs, preferences, and goals. Other in-group members can then accept and adopt the existing group-level customisation for themselves, thus saving time and potentially anxiety over acting in isolation (Triandis 1995). Group members can still define a "personal level" customisation for themselves, but it is up to them to manage whether individual settings will override group settings in certain situations or vice versa. Another benefit of this strategy is that it will create concrete records of current in-group preferences, thus creating a flexible and decentralised way for in-group members to stay up to date with group decisions and issues.

4 Designing a persuasive game

4.1 Persuasive games

During the last few years, games have emerged as a common form of persuasive technology. Konami's *Dance Dance Revolution* (DDR) (Bemani 1998 – 2005) has often been described as a persuasive technology: it is an arcade and PlayStation game that revolves around the concept of dancing. It features a floor pad with markings that light up in accordance with a screen display, and the aim of the game is to match the screen display markings with foot movement (or "dance steps") as closely as possible. DDR can be viewed as persuasive in that it encourages players to be active, thus it falls under the fitness genre of persuasive games.

Persuasive games are also appearing in genres other than fitness, including politics (e.g. the *September 12th* web-based Flash game at `www.newsgaming.com` (Frasca, Battegazzore, Olhaberry, Infantozzi, Rodriguez & Balbi 2003)) and social marketing (such as the *Hubba Challenge*, also a web-based Flash game at `www.hubba.co.nz` (Ministry of Health 2004)). An advantage of the web-based game interface is that it provides a low-cost way to reach significant numbers of people. In addition, the interaction required to drive persuasive games usually eventuates in a level of subject matter comprehension not always obtainable by simple subject matter exposure, which is what more traditional static forms of media rely on.

As a design project for experimenting with our strategies, we decided to design a collectivist game for aiding smoking cessation. Māori[2] culture can be considered as collectivist in a number of ways, for example, extended family plays an important role in everyday life, respect for elders is expected in youngsters, families tend to be larger in number, and carrying out actions to make *other* people proud is a typical motivator (Webster 2001). Smoking rates amongst Māori have been high for some time, and various organisations have been established in New Zealand to aid people to quit smoking and promote "smokefree" lifestyles. Recently, the Quit Group, a New Zealand government-funded organisation that primarily runs a smoking cessation phone support service (Quit/Me Mutu Group 2004), developed an advertising campaign in conjunction with Auahi Kore, a government-funded programme encouraging smokefree lifestyles amongst Māori (Auahi Kore: Health Sponsorship Council 2005). The campaign was titled "It's About Whanau"[3] and was designed to appeal to Māori viewers. The major concept driving the campaign developed organically from a series of interviews recorded by a Maori film company. It centred around how a single individual's smoking affects others in the family, and that people should consider quitting for the benefit of everyone (Quit/Me Mutu Group 2004).

Currently the websites of both the Quit Group and Auahi Kore are fairly static, and are used primarily to provide downloadable resources. Interviews with Quit Group and Auahi Kore members revealed that they are interested in redeveloping their websites to contain more interactive elements, so we describe a design for a smoking cessation game here, aimed at an audience of young Māori (collectivist) players. We will begin by describing the goals and elements of the game. Afterwards, we will show how the aforementioned collectivist persuasion strategies, which harness elements of collectivist culture, can be used in the game design to provide a more persuasive experience for players. To support this discussion, we refer to a series of low-fi paper prototypes of the game interface (see figures 1 through 5).

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[2] Māori are the indigenous population of New Zealand and currently make up approximately 14% of the overall population (Statistics New Zealand 2002).

[3] The concept of *whanau* loosely corresponds to "family", however it can be inclusive of distant relatives and friends.

4.2 The top-level game design

The goal Our goal in designing the smoking cessation game is to persuade people who are either contemplating quitting smoking, or have recently quit smoking (i.e. are in the process of quitting) that quitting permanently will be beneficial for themselves *and* their immediate communities, such as their friends and family. The game might also be played by family members and friends of smokers who want to obtain a simulated perspective of how difficult the quitting process can be for smokers. This information will likely lead to an increase in empathy and might also inform non-smokers how they can be more supportive towards family and friends who are attempting to quit.

General game mechanics The game presents a simulation of 6 weeks of the life of a main character (MC), who has just quit smoking. It is not possible to win or lose the game, as whether MC relapses or manages to stay quit, 6 weeks of game time is still represented.

MC is under *partial* control of the player. As with other simulation games such as The Sims, various situations arise, triggered by the context and by other game characters. These situations require the player to make decisions on MC's behalf about what course of action to take next. The course of action the player takes for MC is selected from a list of available potential actions.

During game set up, players can decide whether MC is male or female and for how long MC has been a smoker. The game has a database of smoking statistics and quitting success rates based on various factors, which will have a part in determining what sort of events take place in MC's life during the 6 weeks, and also MC's chances at quitting success and relapse. At the conclusion of each game, players are shown a screen with long term predictions about MC's attempt to quit smoking, based on MC's behaviour during the game.

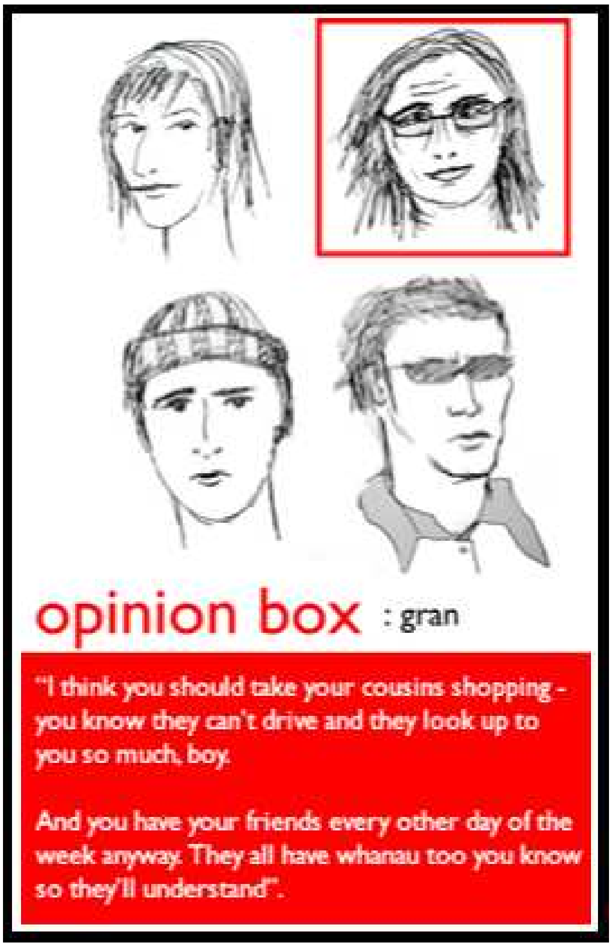
The characters MC is a Māori high school student with a smoking habit who lives at home with his/her parents (both smokers), grand mother (ex-smoker), and younger siblings (occasional smokers). MC's aunts, uncles, and cousins (smokers) are constantly dropping by. MC spends a reasonable amount of time with friends from college (smokers and social smokers), and chats to the neighbours often (non-smokers).

The principal conflict Every so often, MC gets overwhelming urges to smoke, and *will* end up relapsing if the player does not choose an alternative action for him/her. These urges will be linked to contextual and social triggers. The choices the player makes for MC not only affect MC, but also MC's friends and family, in that MC's actions also partially determine *their* actions and reactions.

The initial scenario MC has decided to quit smoking and has not smoked for 24 hours. MC is beginning to suffer withdrawal effects, and is craving cigarettes. MC's friends have just come over to watch a movie, and while they appreciate that MC is trying to quit, a couple of them have already smoked a few cigarettes.

4.3 Applying the collectivism-focused strategies

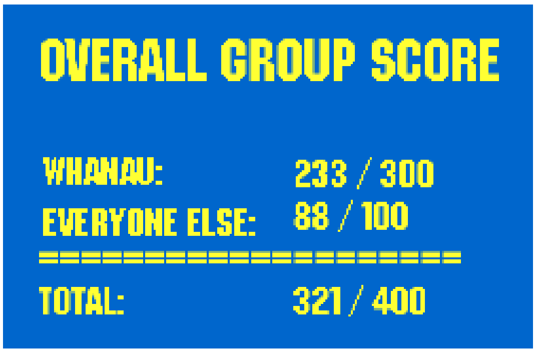
The strategies we described above can be used separately in the design of a persuasive technology, or in conjunction with one another. For the sake of illustrating potential utility however, we describe how they might *all* be used in the game.



"I think you should take your cousins shopping - you know they can't drive and they look up to you so much, boy.

And you have your friends every other day of the week anyway. They all have whanau too you know so they'll understand".

Figure 1: *Group opinion* as a set of viewable opinions



OVERALL GROUP SCORE

WHANAU:	233 / 300
EVERYONE ELSE:	88 / 100
TOTAL:	321 / 400

Figure 2: A *group surveillance* inspired overall group well-being score

Group opinion in action The *group opinion* strategy allows people to find out what other people in their in-group think they should do in particular circumstances, potentially saving time and lowering anxiety levels. In the game, MC often winds up in situations where the player needs to choose what course of action MC should take next. A way to utilise this strategy here is to represent the other game characters on screen when a choice needs to be made. Selecting any one of the characters results in the character sharing her opinion on what she thinks MC should do, as in Figure 1. The player can view none, some, or all of the other characters' views and opinions to help inform the decision he/she makes for MC.

Group surveillance in action The *group surveillance* strategy leverages normative influence to be effective: one person's actions impact upon the group as a whole, whether these actions are positive or negative. This strategy can be utilised in the game in at least two ways, one more "real world"-like, the other more "game world"-like.

In the game world usage, MC's group is assigned a score that reflects the group's overall well-being, as in Figure 2. The well-being score is composed of two components: how in-group members feel about each other (i.e. whether they feel proud of each other, whether they get along well, whether they respect each other) as well as how *out-group members*, people external to the group, view the group as a whole (i.e. their reputation). Although the only in-group member's behaviour the player can affect directly is that of MC, MC's actions will impact upon both the internal and external components of the overall group well-being score.

In the more real world usage, MC's actions affect the other in-group members more directly: they socially confront MC if they feel MC has done something that is disreputable for the group, or if they disagree with a decision he has made. Equally if they approve of something MC has done, they encourage and congratulate him.

Disapproval conditioning in action The *disapproval conditioning* strategy can be used to remind players when they have made a choice for MC that does not align with the high-level "smoke-free" ideals being encouraged by the game. Its implementation is closely related to *group surveillance*, however where *group surveillance* relies more on normative influence and feelings of responsibility towards the well-being of the in-group, *disapproval conditioning* affects just the individual. As with *group surveillance*, *disapproval conditioning* can be implemented in both a "real world" and "game world" manner.

In the "real world" implementation, other game characters openly tell MC if they feel he has done something or made a decision that they believe does not align with their own beliefs. For example, Figure 3 shows a hypothetical screenshot of MC's non-smoker neighbour discussing smoking with MC.

In the "game world" implementation, *disapproval conditioning* can be implemented as a scoring system, as in Figure 4. Each time MC smokes, predictions about his long-term health risks change, along with short term risks such as carbon monoxide levels in blood, etc. This is effectively a version of the "losing lives" mechanic commonly used in games to indicate to players that certain actions are to be avoided if possible.

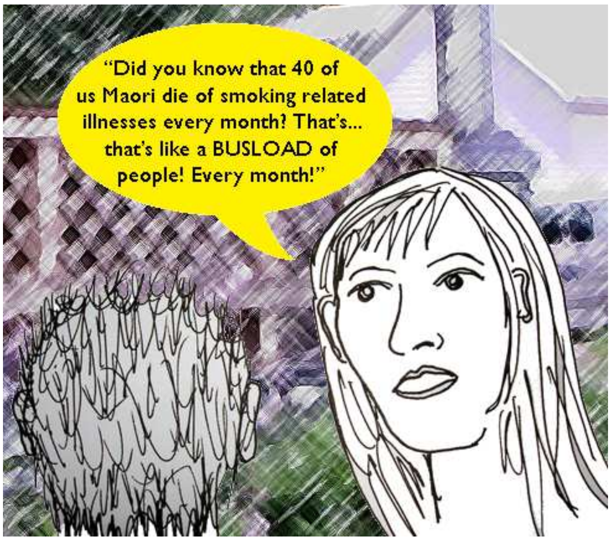

"Did you know that 40 of us Maori die of smoking related illnesses every month? That's... that's like a BUSLOAD of people! Every month!"

Figure 3: Social *disapproval conditioning*

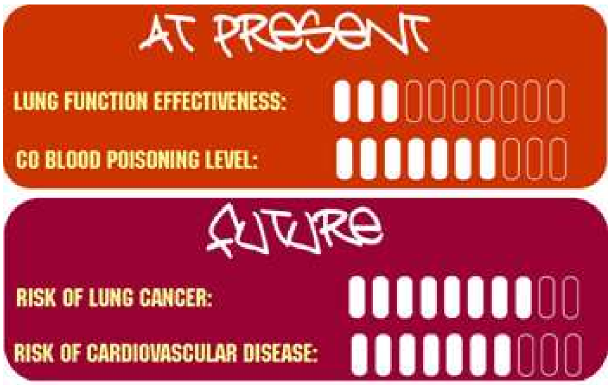

AT PRESENT
LUNG FUNCTION EFFECTIVENESS:
CO BLOOD POISONING LEVEL:
FUTURE
RISK OF LUNG CANCER:
RISK OF CARDIOVASCULAR DISEASE:

Figure 4: *Disapproval conditioning* in the form of variable game scores

Deviation monitoring in action The *deviation monitoring* strategy highlights how a person is deviating from behaviour that he/she would rather not be deviating from. We assume that the player of this game is already contemplating quitting smoking and is therefore interested in knowing about smoking habits of the general population and how their own behaviours compare. The strategy can be embedded in the game to highlight how MC's smoking-related behaviours and habits deviate from that of the general population. For example, every so often an information panel containing this kind of information can be shown on the main game screen, such as the light green panel shown in Figure 5.

Group customisation in action The *group customisation* strategy allows a group of people to all share a level of customisation that might be overridden later by more individual settings. While it does not immediately seem like it might have utility in a persuasive game, it can be used in the game to define "character profiles". There are a range of character profiles available for viewing, each of which describes a character with a certain life story and smoking history that embodies a *group customisation* designed to appeal to a particular group. Selecting to view a character profile in "play" mode triggers a fixed run-through of the game. The player will *not* be able to affect the character's choices in this mode, the understanding being that the fixed run-through represents how people similar to the character might make choices, which will result in particular consequences. The play mode for character profiles acts both as a training option to learn about how the game works, *and* as a fast, low-involvement, stand-alone persuasive message. It is reasonable to assume that players will at least be initially interested in character profiles that seem similar to them, so this method of using

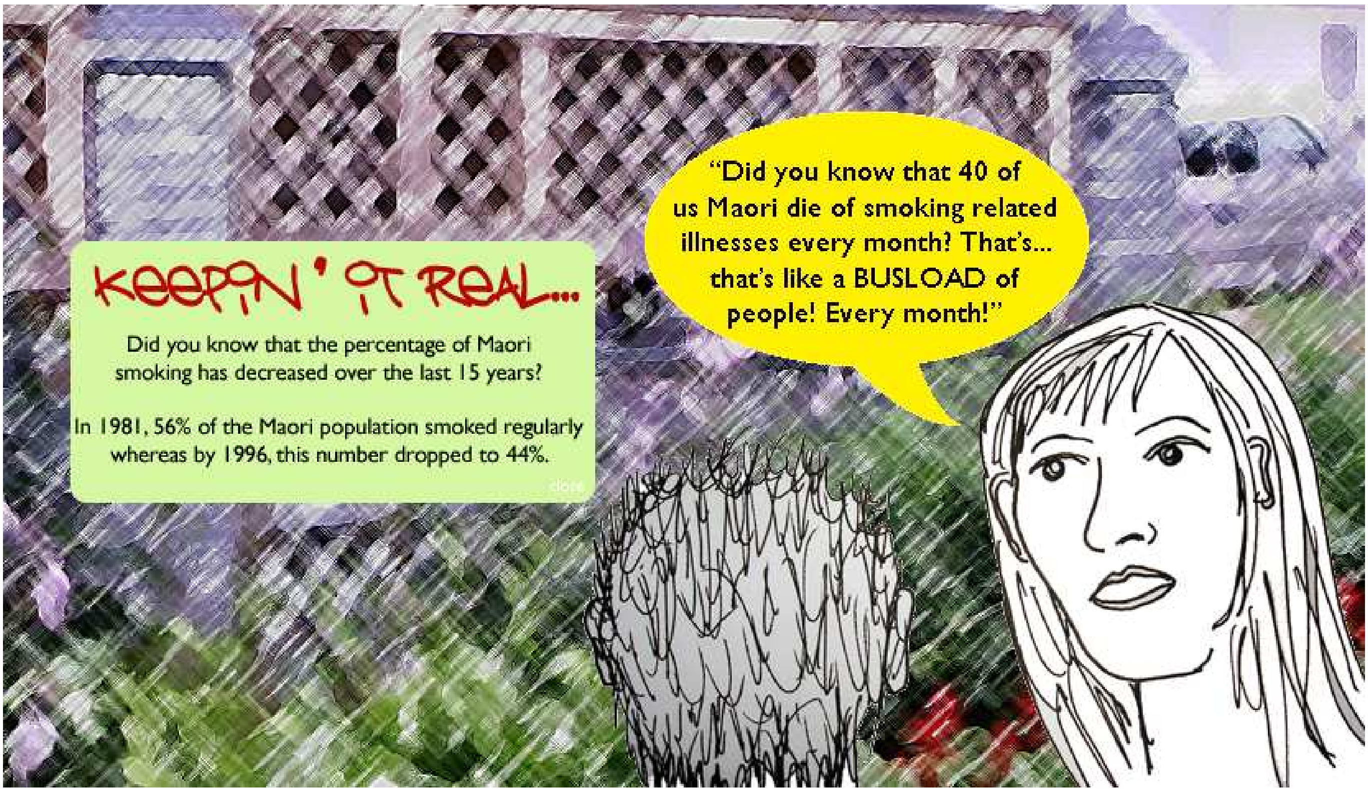

KEEPIN' IT REAL...
Did you know that the percentage of Maori smoking has decreased over the last 15 years?
In 1981, 56% of the Maori population smoked regularly whereas by 1996, this number dropped to 44%.
close
“Did you know that 40 of us Maori die of smoking related illnesses every month? That's... that's like a BUSLOAD of people! Every month!”

Figure 5: The “keepin' it real” box is a *deviation monitoring* inspired information panel

group customisation benefits from the advantages of both customisation *and* simulation.

4.4 A participatory design approach

The game we have described is still in early prototype stages. Undoubtedly, developing such a game purely from literature findings may yield a product that is not as well tailored to Māori youth as it might be. To fine tune the game strategies, we intend to conduct some pre-test work with sample target users from the Auahi Kore research participant register to establish whether the embedded tactics are indeed culturally appropriate. After modifying the game strategies to comply with the sample user feedback, we will develop a working prototype of the smoking cessation game with two modes: one more individualistic, one more collectivist. We will then empirically validate the effectiveness of our proposed strategies by testing the game modes on audiences of self-identified individualists and collectivists to ascertain if the culturally-matched persuasive approach will be more effective than an unmatched approach.

5 Conclusion

To date, cultural aspects of persuasive technologies and their underlying strategies have been reasonably neglected, even though these technologies are beginning to enjoy a wider audience world-wide, especially via persuasive websites. We discussed how the omnipresence of culture impacts upon design strategies that have emerged for persuasive technologies, both at a conscious *and* unconscious level. We believe that by taking into account the cultural background of target users and consciously focusing on the design of persuasive interactions, the persuasive technologies that result will be more effective. We identified a principled set of strategies designed to appeal and integrate with collectivist beliefs and behaviours, based on documented behavioural patterns of collectivist societies. Briefly these strategies are: *group opinion*: allowing people to find out what in-group members think they should do in particular circumstances to save time and lessen anxiety; *group surveillance*: leveraging normative influence in behaviour change; *deviation monitoring*: highlighting how a person is deviating from behaviour that he/she would rather not be deviating from; *disapproval conditioning*: negative reinforcement as a means of training; and *group customisation*: allowing for an overall “in-group” application setting, that acknowledges the needs, preferences, and goals of a particular group.

We also demonstrated how these strategies may be embodied in persuasive technologies by describing the design of a game to aid smoking cessation that used *all* of the aforementioned strategies. While the game is designed to appeal to a particular collectivist audience (i.e. a young, Māori audience), our persuasive strategies are designed to be age and gender independent, and in fact might also be effective on a more individualist audience in certain situations. For instance, many *western* support groups and networks, including Alcoholics Anonymous and Weight Watchers, leverage the effects of social support and social comparison. This highlights the fact that people from individualist societies can *also* find collectivist strategies to be useful.

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References

Aaker, J. (2000), ‘Accessibility or Diagnosticity? Disentangling the Influence of Culture on Persuasion Processes and Attitudes’, *Journal of Consumer Research* **26**, 340 – 357.

Aaker, J. & Maheswaran, D. (1997), 'The Effect of Cultural Orientation on Persuasion', *The Journal of Consumer Research* **24**(3), 315 – 328.

Auahi Kore: Health Sponsorship Council (2005), 'Auahi Kore', `http://www.auahikore.co.nz/`.

Bemani (1998 – 2005), 'Dance dance revolution', Konami Corporation.

Berdichevsky, D. & Neuenschwaner, E. (1999), 'Toward an Ethics of Persuasive Technology', *Communications of the ACM* **42**(5).

Biswas, A., Olsen, J. & Carlet, V. (1992), 'A Comparison of Print Advertisements from the United States and France', *Journal of Advertising* **21**(4), 73 – 81.

Dautenhahn, K. (1999), Robots as Social Actors: AURORA and the Case of Autism, *in* 'Proceedings CT99, The Third International Cognitive Technology Conference'.

Fazio, R. H. & Roskos-Ewoldsen, D. R. (1994), Acting As We Feel: When and How Attitudes Guide Behaviour, *in* T. C. Brock, ed., 'Persuasion: Psychological Insights and Perspectives', Allyn and Beacon, pp. 71 – 93.

Fogg, B. (1998), Persuasive computers: perspectives and research directions, *in* 'CHI '98: Proceedings of the SIGCHI conference on Human factors in computing systems', ACM Press/Addison-Wesley Publishing Co., pp. 225–232.

Fogg, B. J. (2003), *Persuasive Technology: Using Computers to Change What We Think and Do*, Morgan Kaufmann Publishers.

Frasca, G., Battegazzore, S., Olhaberry, N., Infantozzi, P., Rodriguez, F. & Balbi, F. (2003), 'September the 12th', `http://www.newsgaming.com/games/index12.htm`.

Gurhan-Canli, Z. & Maheswaran, D. (2000), Comparative Advertising in the Global Marketplace: The Effects of Cultural Orientation on Communication, William Davidson Institute Working Papers Series 328, William Davidson Institute at the University of Michigan Business School. available at http://ideas.repec.org/p/wdi/papers/2000-328.html.

Hall, E. (1976), *Beyond Culture*, Anchor Press/Doubleday.

Han, S.-P. & Shavitt, S. (1994), 'Persuasion and Culture: Advertising Appeals in Individualistic and Collectivistic Societies', *Journal of Experimental Social Psychology* **30**, 326 – 350.

Hofstede, G. (1996), *Cultures and organisations: Software of the mind*, McGraw-Hill Education.

Khaled, R., Noble, J. & Biddle, R. (2005), Developing Culturally-Aware Persuasive Technology, *in* D. Day, V. Evers & E. D. Gado, eds, 'Designing for Global Markets 7: Proceedings of the 7th International Workshop on Internationalisation of Products and Systems', pp. 167 – 173.

King, P. & Tester, J. (1999), 'The Landscape of Persuasive Technologies', *Communications of the ACM* **42**(5).

Kluckhohn, F. & Strodtbeck, F. (1961), *Variations in value orientations*, Row, Peterson.

Lin, C. (1993), 'Cultural Differences in Message Strategies: A comparison between American and Japanese TV commercials', *Journal of Advertising Research* pp. 40 – 48.

Ministry of Health (2004), 'No Rubba No Hubba Hubba', `http://www.hubba.co.nz`.

O'Grady, L. (2003), 'Depicting credibility in health care web sites: towards a more usable means', *SIGCAPH Comput. Phys. Handicap.* (75), 17–18.

Pavlou, P. & Chai, L. (2002), 'What Drives Electronic Commerce Across Cultures? A Cross-Cultueral Empirical Investigation of the Theory of Planned Behaviour', *Journal of Electronic Commerce Research* **3**(4), 240 – 253.

Quit/Me Mutu Group (2004), 'The Quit Group Website', `http://www.quit.org.nz/`.

Schwartz, S. (2003), Mapping and Interpreting Cultural Differences around the World, *in* H. Vinken, J. Soeters & P. Ester, eds, 'Comparing Cultures, Dimensions of Culture in a Comparative Perspective', Brill.

Shelat, B. & Egger, F. N. (2002), What makes people trust online gambling sites?, *in* 'CHI '02: CHI '02 extended abstracts on Human factors in computing systems', ACM Press, pp. 852–853.

Sillence, E., Briggs, P., Fishwick, L. & Harris, P. (2004), Trust and mistrust of online health sites, *in* 'CHI '04: Proceedings of the 2004 conference on Human factors in computing systems', ACM Press, pp. 663–670.

Sinha, R. & Swearingen, K. (2001), Comparing Recommendations Made by Online Systems and Friends, *in* 'Delos-NSF Workshop on Personalisation and Recommender Systems in Digital Libraries'.

Statistics New Zealand (2002), '2001 Census: Ethnic Groups- reference report', `http://www.stats.govt.nz`.

Swearingen, K. & Sinha, R. (2002), 'Interaction Design for Recommender Systems'.

Tansey, R., Hyman, M. & Zinkhan, G. (1990), 'Cultural Themes in Brazilian and US Auto Ads: A Cross-Cultural Comparison', *Journal of Advertising* **19**(2), 30 – 39.

Triandis, H. (1995), *Individualism and Collectivism (New Directions in Social Psychology)*, Westview Press.

Triandis, H. C., Bontempo, R., Villareal, M. J., Asai, M. & Lucca, N. (1988), 'Individualism and Collectivism: Cross-Cultural Perspectives on Self-Ingroup Relationships', *Journal of Personality and Social Psychology* **54**(2), 323 – 338.

Webster, A. (2001), *Spiral of Values*, Alpha Publications.